

*Note of the Observation of Cilia in Grantia.* By WILLIAM MURRAY DOBIE, M.D., Annual President of the Royal Medical Society of Edinburgh.

The present somewhat dubious position of the Sponges in the systems of naturalists, leads me to hope that the following isolated observation may not be without its value, as an additional proof of the distinctly animal nature of these organisms.

At the end of last February, while residing for a short time at Marshmeadows, near Berwick-on-Tweed, I had an opportunity of examining perfectly fresh specimens of a species of *Grantia*, in which very distinct and vigorous currents were in constant operation. Having scraped a portion of the gelatinous covering from the interior wall, and laid this on a piece of glass, and covered it with a thinner piece, I viewed the specimen through an achromatic microscope, amplifying about 150 diameters. The field of view was crowded with the minute granular cellules of the sponge, which, although they do not always show a distinct nucleus, are, I have no doubt, of the same nature as nucleated particles in general. These cellules were in a state of active and independent motion, and, when aggregated into masses, very much resembled some of the Compound Monads. When a single particle was seen isolated, the motion was of a jerking character, suggesting at once the existence of cilia, if they could have been seen. I now proceeded to a more accurate scrutiny. Another specimen was selected; a portion of the gelatine was diluted with water pressed from the interior of the sponge, and the whole covered with a film of glass of 1-120th of an inch in thickness. This I viewed with a very excellent 1-8th of an inch lens, by Smith and Beck, magnifying 450 diameters. The size and apparent motion of the cellules being thus greatly increased, I now could, without much difficulty, detect extremely attenuated cilia attached to every particle in the field of view, and lashing with considerable vigour. When the light and focus were adjusted with great care, I was able to sketch a considerable number of the individual particles. The average length of each cilium was equal to three times the diameter of the cellule to which it was attached. No perceptible difference in thickness could be observed throughout its entire length. Each cellule very strongly resembled some species of Monads. The motion ceased in all the particles very soon after separation from the general mass. I was able to repeat this observation several times in the *Grantia*. In the *Halichondria*, which I found at the same time, no currents could be seen. Only in one example could I find anything resembling ciliated particles, and that very imperfectly. No further opportunity presented itself for continuing these observations.

From this it seems evident, that in the *Grantia* the whole inner surface is lined with a ciliated epithelium, and that the currents are produced by the motion of these filaments.

I have little doubt that cilia will eventually be found to exist in all marine sponges, where currents are in operation, provided sufficient

care be taken to examine the cellules, in perfectly fresh specimens, with first-rate instruments.

The evidence for the animality of the *Porifera* is, I think, more conclusive than some naturalists of the present day are inclined to admit. I feel assured that few botanists would be disposed to claim for these organisms a truly vegetable nature. The following peculiarities taken together seem sufficient to establish their true animal nature:—The existence of distinct currents in definite directions; vibratile cilia; ciliated locomotive gemmules; peculiar animal smell of burnt gelatinous matter. I may also mention the observations of Milne-Edwards and Audouin on the Irritability of *Tethea*\*, Dr. Johnston informs me, that some very recent observations on a large foreign species tend remarkably to confirm the statements of Audouin and M.-Edwards. Dujardin's interesting observations on *Spongilla* also tend to prove the sponge an animal†. He noticed the remarkable property which detached portions of the granular matter of *Spongilla* possess, of spreading into "*Expansions variables en lobes arrondis, comme certaines amibes.*" Both Dujardin and Professor Allen Thomson have observed cilia in the freshwater sponge; but the existence of cilia in marine sponges has, so far as I am aware, been always denied. In conclusion, I will only allude to Mr. J. A. Carter's interesting observation of species of *Spongilla* in the water-tanks in Bombay‡. Mr. Carter confirmed and considerably extended Dujardin's observations, but did not detect cilia. All these circumstances being considered, the animality of the *Porifera* will not, I think, be so equivocal as the following concluding sentence of Professor Rymer Jones's late article on the *Porifera* seems to intimate: "The admissibility of sponges into the animal series is indeed extremely problematical, and we doubt not, that among naturalists of the present day, the balance of opinion would be unfavourable towards retaining them in the rank, which they at present occupy in zoological classification §."—*Proceedings of the Royal Medical Society of Edinburgh*.

*Experimental Researches upon the Process of Fecundation in Mosses.*

By M. H. PHILIBERT.

The author in concluding his memoir gives the following *résumé* of his conclusions:—

1. The *archegonium* of Mosses is a true ovule.
2. The external envelope, which has been called *epigonium*, and which afterwards becomes the calyptra, is analogous to the nucleus of the ovule of the Phanerogamia.

\* Hist. Nat. du Litt. de la France, vol. i. p. 78.

† Dujardin, Hist. Nat. des Infusoires, p. 305.

‡ Notes on Sponges. Trans. Med. and Phys. Soc. Bombay, No. 8. Reprinted in the 'Annals and Mag. of Nat. Hist.' New Series, April 1848. A second paper on the same subject appeared in the third volume of the 'Annals,' 1849.

§ Cyclopædia of Anat. and Phys. vol. iv. p. 70.